REMARKS

The Examiner states that a certified copy of the 99403266 application has not been filed. Applicants submit herewith a certified copy of 99403266.

Applicants respectfully submit claims 1-4, 7 and 9-13 are patentable over Hellberg in view of Ostman under 35 U.S.C. 103(a). Hellberg and Ostman fail to teach or suggest "means for subdividing the detected band into sub-bands." The Examiner relies upon FIG. 5 and column 6, lines 4-21, but in this passage and figure Hellberg is mixing one signal with another signal and is not subdividing any detected band. Furthermore, Hellberg converts the entire signal bandwidth (Column 4, lines 5-7 and line 12) and does not subdivide the detected signal.

Furthermore, Hellberg and Ostman fail to teach or suggest "means for superimposing the sub-bands into a plurality of components...". Again, Hellberg is not using sub-bands as the Examiner contends.

With respect to "means for processing that portion of the information contained in each component separately," Hellberg has access to all of the information because he uses the full bandwidth of the desired signal. For at least these reasons, the Examiner rejection of Hellberg in view of Ostman is in error and should be withdrawn.

Applicants respectfully submit that claims 15 is also patentable over Hellberg in view of Ostman under 35 U.S.C. 103(a). Hellberg is basically a diversity receiver (Hellberg's own assessment, see col. 4, lines 19 - 23) where the channel impairment is the A/D non-linearity creating harmonics of an interfering signal (col. 4, line 20 - 21) that fall on-channel for a weaker desired signal. As Hellberg mentions multiple times throughout the spec, the same signal (combined desired plus interferer is implied) is converted down to two different digitization (or A/D input) <u>frequencies</u> (the f1 and f2 of both figures 2 and 5) that are offset from each other (see e.g. col. 2, line 35; col. 4, line 27; col. 4, line 62 – 64; col. 5, line 24; col. 6, line 15). There is no special phase relationship between these two frequencies since it could not be maintained (they are at two different frequencies, so the relative phase between them is constantly changing). Claim 15 (Amended) of the present application requires "converting the detected signal to baseband in I and Q components", that is to say that a quadrature phase relationship is <u>maintained</u> between them.

Claim 15 continues: "each component having a bandwidth (BW/2) equal to half said bandwidth (BW) of a wide band carrier signal" and "further I and Q components to form sub-components (II, IQ, QI, and QQ), where each of the sub-components has a bandwidth (BW/4) equal to a quarter of said bandwidth (BW) of a wide band carrier signal". Nowhere does

Hellberg mention that he is splitting up a signal into components and sub-components having smaller bandwidths. In fact, he mentions (col. 4, line 5 – 7 and col. 4, line 12 "wide bandwidth") that he is passing some interfering signals along with the modulated receive signal, and not just some portion of the modulated signal. In Hellberg, the entire input signal bandwidth (and more) is converted. Note again that Hellberg's local oscillators 36, 42, 46 & 50 all run at different frequencies (see col. 6 lines 13-15 and 44-53) so that no reduced bandwidth is obtainable. The passages quoted by the Examiner do not support the Examiner's contention that Hellberg discloses sub-components having a bandwidth (BW/4).

Claim 15 also requires "processing means operable, in a wideband mode for separately processing each of the sub-components (II, IQ, QI, and QQ) to extract portions of the originally transmitted information". Hellberg processes all of the information at once, not just some portion, because he has the full bandwidth of the desired signal.

In addition, claim 15 requires "processing means operable, in a wideband mode ... and operable, in a narrowband mode". The Examiner recognizes that Hellberg fails to teach a dual mode receiver and relies on the combination of Hellberg with Ostman. However, Ostman's teaching does not point towards the invention claimed in claim 15 but rather away from it. Thus, Ostman uses a wide bandwidth converter to operate on both the wideband and narrowband signals. Claim 15 of the present invention requires "processing means operable, in a wideband mode for separately processing each of the sub-components (II, IQ, QI, and QQ)", which neither Hellberg nor Ostman discloses. This feature enables the wide bandwidth input signal to be processed at narrower bandwidths while still enabling the same means to be used for narrow band operation, which is submitted to be non-obvious. For at least the above reasons, Ostman does not each the above-noted features of claim 15 that Hellberg fails to teach and that claim 15 is novel and not obvious and is allowable.

Applicants respectfully submit claims 5 and 6 are patentable over Hellberg in view of Ostman and further in view of Hyatt under 35 U.S.C. 103(a). Hyatt fails to teach or suggest "mixing with the locally generated signals uses multiplier DAC's, " as stated in claim 5, from which claim 6 depends. Hyatt uses multiplying DACs to multiply a reference signal by an input signal in a correlator function.

Applicants respectfully submit claims 8 and 14 are patentable over Hellberg in view of Ostman and further in view of Lee under 35 U.S.C. 103(a). Claims 8 and 14 include a programmable oversampling ratio for Wideband or Narrow band conversion or processing, respectively. It is respectfully submitted that Lee does not contain any description of an oversampling ratio programmable for Wideband mode or Narrow band mode conversion, not

even in the passage that the Examiner refers to. Lee describes a passband sigma delta converter operating with a passband at microwave frequencies. For at least this reason, claims 8 and 14 are allowable over Hellberg, Ostman and Lee.

Applicants herein amend claim 16 to include objected to claim 17. Claim 17 was objected to only because it depended from rejected base claim 16. Thus, the rejection s of claims 16-19 are herein moot and claim 16-19 should be deemed allowable.

FIG. 1 of the drawings and the paragraph on page 5, beginning on line 4 are amended to fix errors. No new matter is added because the correction of the errors would be clear to one of ordinary skill in the art. For example, "analog to digital" in the specification on line 4, page 5 should be changed to "digital to analog" so that the resulting outputs are analog as stated on line 5 on page 5. Therefore, the elements 106 and 107 are amended in FIG. 1 to be "D/A" instead of "A/D." In addition, the arrows should point from the D/A converters 106 to 107 to the Pi/2 because "converters 106 and 107 to produce quadrature analog outputs (sin(wt) and cos(wt), where w=2*Pi*BW/4) which in turn drive quadrature network 108 which divides by Pi/2," as stated in the specification. In addition, arrows were added to point to quadrature mixers 102,104, for clarity since Pi/2 "deliver[s] two RF or IF oscillator signals which are in quadrature to feed the two Local Oscillator ports of the quadrature mixers 102,104."

Believing to have responded to every issue raised by the Examiner in the last communication mailed, Applicants believe the present Application is currently in a condition of allowance. Applicants earnestly solicit allowance of all pending claims. Please contact Applicants' practitioner listed below if there are any issues.

Respectfully submitted,

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